THE

# VETERINARY JOURNAL

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## Editorials.

### THE IMPORTANCE OF THOROUGHNESS IN DISINFECTION AFTER SWINE FEVER.

An article written by a contributor to this month's Veterinary Journal adds a further tribute to the necessity for *complete* and *thorough* disinfection in attempting to stamp out any contagious disease. The particular one referred to in this instance was swine fever, and, as it is not exaggerating to assert that no more contagious disease than this exists, nor one which has given more trouble or anxiety to the officials of the Board of Agriculture, it is very interesting to read of an instance in which the source of infection was carefully traced to a cause which might easily have been overlooked. For further details we recommend our readers to read the article in question.

### HORSES AND THE WAR.

The supply of horses for the war has up to the present shown no shortage, and many good and fit animals have been taken away for their appointed work. The replacing of substitutes for these animals in the studs concerned has been pretty well accomplished in most cases, but it cannot be expected that with such a drain on present resources scarcity of material and high prices will not occur and be maintained for some time to come. The contemplation of the amount of horse flesh necessary for home defence has led many expert men to call attention to our inadequate supply here, and if normally the supply is too small for home defence, what can be said of it when the

requirements of an expeditionary force operating in a country near at hand have also to be taken into consideration?

In the piping times of peace there is a tendency for Governments to deal primarily with pressing social matters affecting large masses of people and to give paramount attention to them, whilst minor matters, almost as important to the life of a nation but not so pressing, and touching a lesser circle of humanity, get neglected or put aside.

For many years the horse-breeding industry in this country has been unable to come into its own, operations have been conducted in a haphazard fashion with inadequate financial support by the State, and yet "the derivation of chivalry is not an historical fact to be burked." Fortunately we have in France an ally in this war which has spent as much as £300,000 in one year on horse breeding. Incidentally we may also mention here that the United States has spent an average of £60,000 a year on the improvement of cavalry horses. This makes the sum of £4,000 spent by us (until recently) on similar operations seem paltry indeed, and yet there is great need for an adequate supply of light horses to be kept up here.

In 1831 we exported 718 horses from our shores, and in 1908 we sent away 53,000. We have a wastage of about 4,000 army horses annually in times of peace. What will be our losses through this war, and what steps will be taken by the State to deal with the loss? That the scarcity will be great nobody can deny, and the question when the war is over will be how the supply can again be brought to normal and afterwards increased, and how something really effective can be done for horse breeding.

Let us hope that some influential man, a veritable giant in horse matters, will arise, who will be patriotic, persistent and knowledgeable enough to keep pegging away in Parliament on the subject until a well-thought-out plan and scheme have been evolved, carried through, and continued with adequate public and Government support.

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His Majesty the King has been graciously pleased to accept and acknowledge a copy of the International Congress (August) Number of The Veterinary Journal.

# General Articles.

## SOME FURTHER EXPERIMENTS IN THE PREVENTION OF BOVINE EPIZOOTIC ABORTION.

By J. BASIL BUXTON, F.R.C.V.S., D.V.H.
*Wellcome Physiological Research Laboratories, S.E.*

FOLLOWING some laboratory experiments carried out with a view to preventing contagious abortion of cows, and a short series of field experiments, I read a brief paper before the Eastern Counties' Veterinary Society at Colchester. The results of these experiments were recorded, and it was pointed out that on account of their small number and the meagre data then available no definite conclusions should be drawn from the results. At the same time I appealed to the members present to afford me by their co-operation an opportunity of further investigating the prophylactic properties of a vaccine, the details of which were given. As a result of that appeal several practitioners volunteered to provide the clinical material and to test the properties of this vaccine. The preliminary report briefly outlined the results of the following experiments carried out with rabbits, goats, and cows.

### RABBIT EXPERIMENTS.

Twenty-four full-grown, non-pregnant female rabbits received weekly injections of a saline suspension of *Bacillus abortus*, which had been killed by heating for one hour at 60° C. Three injections were given, the dose being 5, 10, and 25 thousand million organisms. From three to four weeks after the last injection the animals were served, and all were infected by means of a saline suspension of living organisms which had been grown for twenty-four hours on surface glycerine agar. All were infected forty-eight hours after coitus. Of the twenty-four animals six were infected by the intravenous injection of 0·5 c.c. of a rich suspension of living organisms and all aborted during the third week of pregnancy.

Nine were infected by the administration of 2 c.c. of the same suspension *per os* and all went full time and produced normal young, while of three normal control rabbits two aborted and one produced normal young. Nine protected rabbits were infected *per vaginam*, and of these eight produced normal young

while one aborted. Three normal control rabbits infected in a similar way all aborted.

Twenty adult non-pregnant female rabbits were infected twenty-four hours after coitus, ten *per os* and ten *per vaginam*. Eight from each of these two groups received subcutaneous injections of killed *B. abortus* in similar doses to the twenty-four rabbits originally protected. Four rabbits, two from each group, were kept as controls.

Of the eight rabbits infected *per os* all produced normal young, while of those infected *per vaginam* five produced normal young and three aborted.

Of the four control rabbits two were infected *per os* and two *per vaginam*. One of the two infected *per os* aborted and one produced normal young, while the two infected *per vaginam* aborted. The results obtained from these rabbit experiments were obviously not entirely a success, for, of the rabbits protected and subsequently infected *per vaginam*, while eight produced normal young one aborted; and of the three control rabbits infected *per os*, one produced normal young while two aborted. Of the twenty infected immediately after coitus and subsequently protected, while the eight infected *per os* all produced normal young, three of the eight infected *per vaginam* aborted. It would appear, therefore, that infection *per os* in the rabbit, even when a strain of the organism pathogenic for that animal is employed, is not entirely satisfactory. Intravenous infection, in spite of previous attempts at protection, produced abortion in every case.

These results were, however, sufficiently interesting to justify a continuation of the experiments with other animals.

### Goat Experiments.

*Goat* 1.—One adult non-pregnant female goat received three subcutaneous injections of a saline suspension of killed *B. abortus* in doses of 50, 100, and 200 thousand million organisms at intervals of seven days. Seven weeks later she was served, and two months after coitus was infected *per vaginam*. She went full time and produced one normal young. The complement-fixation titre, which previous to the immunization equalled 0, was found to rise steadily during the injections, and to have reached the maximum one month after the last injection, then being equal to 0·0025. It then fell gradually and immediately before the animal

was infected was equal to 0·005. Four days after the injection of living material into the vagina it equalled 0·0001. Three weeks after the birth of the kid the complement-binding titre had again fallen to 0·005 and the agglutinating titre was 1 in 1,000.

*Goat* 2.—An adult female was protected in a similar manner. Two months after coitus she was infected *per os*. She went full time and produced two fully developed young, which were breathing when delivered, but owing to the length of time which elapsed during parturition (this being the first time that the animal had been bred from, and the kids large in proportion to the mother) subsequently died. The complement-binding titre showed in this case also a somewhat similar curve.

After the injections the titre was found to have risen from 0 to 0·0025. Two months later it had fallen to 0·01, and seven days after infection *per os* rose to 0·0025. Two months after parturition it had fallen to 0·2.

*Goat* 3.—An adult female was protected in a similar way to goats 1 and 2. Two months after coitus she was infected by an intravenous injection of living organisms, and forty-eight hours later she aborted.

*Goat* 4.—An adult female was employed as a control. One month after coitus she was infected *per vaginam* and aborted six weeks later.

Although the animals used in these experiments were few in number the results were encouraging. While the animal which was protected and subsequently infected by the intravenous injection of living organisms aborted, those infected by large doses by the ordinary channels of entry of the organism resisted infection and the control animal aborted. Four different strains of *B. abortus* were used for protection, and a fifth and different strain for purposes of infection. In no case was it found possible to obtain cultures of the organism from the uterus of protected animals which had produced young; but since it was not possible to recover the organism in every case from animals which had aborted, one was not able to attach much significance to this fact.

### Cow Experiments.

These experiments were carried out on farms on which contagious abortion was known to exist, and the veterinary surgeons in attendance were kind enough to inject the material with

which I supplied them for the protection of the animals, and subsequently to furnish me with reports. My thanks are due to Mr. Warren, F.R.C.V.S., of Hadlow, who has helped to furnish me with many important facts concerning these experiments.

*Farm* 1.—The serum of eleven cows was tested by both complement-fixation and agglutination methods, and four were found to react, the titres being 0·02 and 1/25, 0·05 and 1/1,000, 0·1 and 1/300, and 0·02 and 1/500. Each of the cows received three subcutaneous injections of a saline suspension of killed *B. abortus*, the doses being 75, 150, and 300 thousand million organisms. One reactor was later slaughtered as she was in good condition, and the other three calved normally. At that time five of the seven non-reactors had calved normally and the remaining two had not then gone full time. Since then Mr. Warren has informed me that the two remaining cows have calved normally. In this case, therefore, normal calves have been obtained from reactors which had aborted and others which had not, and also from animals which gave a negative reaction to the combined serum tests.

*Farm* 2.—There were on this farm thirteen cows in all, eight old cows and five recent purchases. All the old cows had been on the farm two years, and the owner stated that new cows invariably aborted. Of the eight old cows, four had aborted the previous calf. All the old cows and one new one showed complement-binding titres to *B. abortus*.

As in the case of Farm 1, all the cows were protected and received similar doses. At the time of making my first communication eleven cows had calved normally and two had not then gone full time. Since then all the cows have calved normally, it being the first time to the owner's knowledge that such had occurred.

Through the kindness of Mr. Arthur Holl, M.R.C.V.S., New Buckenham, I have been able to carry out further experiments by attempting the immunization of two herds. The clinical diagnosis of epizootic abortion was confirmed by a series of complement-fixation and agglutination tests carried out with the blood from several animals in each of the herds, the first of which consisted of forty-eight animals and the second of one hundred animals. So far time only permits of a definite result

being obtained from the protection of the first of these herds, of which Mr. Holl reports as follows:—

"A client, who owns a herd of forty-six cows and two bulls, had during the past two years greatly suffered from abortion in his cows. I was asked to go and look at these cows, and he showed me five cows which had recently aborted, one of these five having aborted three times in succession. I advised him to have the blood from these cows tested, to which he agreed. I sent the blood of these five cows to Mr. J. B. Buxton to be tested. I received a letter from him in the course of a day or two saying that the five samples of blood gave positive reactions to both agglutination and complement-fixation tests and showed very high titres in both. Mr. Buxton advised me to inject the herd with vaccine, which I did, and up to the present five cows have calved normally and not a single one has aborted. I have just started to protect another herd of cows, and shall be pleased to give the result later on. August 25, 1914."

In these experiments a slight modification has been adopted in the method of immunization, the course being extended to five injections at intervals of one week, and increasing from a primary dose of 10 thousand million organisms in 10 c.c. to a final dose of 500 thousand million organisms in 25 c.c. of saline.

Similar experiments were carried out with a herd of seventy animals in conjunction with Mr. Ledger, M.R.C.V.S., of Redhill. Mr. Ledger reports that whereas, previous to the protection of the cows, the percentage of abortions had been very high and had entailed a serious loss to the owner, no abortions had occurred since the injection of the vaccine. More detailed results of experiments carried out with this and other herds will be furnished in a further communication at a later date. While the results obtained so far are eminently satisfactory, one must admit that the element of coincidence has not entirely been eliminated. It is, however, hardly to be expected that coincidence would account for the fact that on three farms controlled by three practitioners, the abortions should cease immediately after the course of immunization. The evidence would have been more conclusive had it been possible to have left some of the animals unprotected to act as controls, as in the case of the laboratory experiments, but owners are not anxious to risk the loss of

even one calf when there appears to be some hope of preventing it. The good results attending the experimental work may be ascribed partly to the fact that the disease is localized and of a subacute or chronic nature, thus rendering the effective elaboration of antibodies more marked than in conditions of a more acute nature, and also that very large doses of a polyvalent vaccine were employed. The dosage was based entirely upon experience gained in the immunization of other animals against various organisms for the production of specific anti-sera, and as a result of this and other experimental immunization one has been forced to the conclusion that in veterinary work, certainly, no definite dosage can be laid down for the effective elaboration of antibodies in more than one disease. Experience obtained from experimental work alone enables one to decide when and by what means the most efficient response on the part of the animal organisms can be induced, and it is only by obtaining the maximum efficiency that completely successful results can be produced. The enormous economical significance of a successful method of preventing contagious abortion among cows is obvious, and it is with a view to carrying out further research on the lines already adopted that I confidently make an appeal to members of the profession, in whose practices this disease occurs, to aid me by their co-operation in establishing the efficacy of this vaccine in the eradication of the complaint.

## Conclusions.

From the foregoing experiments it would seem that there are reasonable grounds for assuming that it is possible to produce in susceptible animals a sufficiently high degree of immunity against *B. abortus* by means of suitable doses of a vaccine composed of killed organisms. The figures at present available are not sufficiently numerous to permit of a definite assertion being made. In view, however, of the many advantages which this method of protection possesses over that entailing the use of living organisms in which the element of risk of infection from the vaccine has to be taken into consideration,* further work in this direction is of the utmost importance.

A further communication supplying a more complete set of figures will be made at an early date.

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* Surface, F. *American Veterinary Review*, September, 1913.

## SACKS AS CARRIERS OF SWINE FEVER.

By J. F. D. TUTT, M.R.C.V.S.
*Winchester.*

We are told by various authorities that this scourge of swine can be carried over the country by pig's feet, even though they are not affected; also by dealers, cattle trucks, fairs, markets, birds, and so on.

No reference is ever made to an agent that in all probability is much commoner, and one that, no doubt, accounts in no small measure for the unsatisfactory efforts of the authorities to stamp out the disease, not only in this country, but in others also.

The agents that are always overlooked, and which, I believe, are very active propagative agents, are the *sacks in which pollard and other fodder* is generally sent out.

In most cases, as soon as a pig is taken ill, a sack is almost invariably thrown over it, in the sty. Away goes the infected sack (on the demise of the pig) with others to the vendor, who refills them, and they are sent out to another client, amongst whose pigs the disease, which has hitherto been unknown, makes its appearance.

A striking example of this was recently related to the writer by an inspector who has had a life-long experience of the disease. In one district he could find no clue from whence the malady was coming. Cases of the disease were occurring with remarkable frequency in sties in a district which was previously quite healthy, and as soon as one case was dealt with another one cropped up. As none of the owners had intermingled with each other's stock, the problem of from whence the disease was coming was by no means an easy one to solve. On making inquiries he found that the different pig-owners had all obtained their pig food and other fodder from one particular merchant, and that no disease had occurred amongst their pigs until they had purchased the food from him. It was also of interest to note that those few pig-owners who had bought their pig food and other fodder from a different source had remained free of the disease.

The vendor of the "infected" sacks was approached, and for a consideration agreed to destroy all the sacks, which was

done in the presence of the inspector. The result was—no more swine fever.

In this case his sacks had obviously become contaminated on some previous occasion, in the manner alluded to at the beginning of this article.

The writer believes that the fact that sacks are fertile agents of propagation of the infection has long been recognized by the general practitioner, who has unfortunately only too small a share in the control of the disease, when practical knowledge, as in other things, is of more value than a whole volume of theory. No disease requires more drastic revising as regards administration and searching investigation than swine fever in this country.

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## Equine Clinicals.

### PICKED-UP NAIL—SUPPURATING ARTHRITIS—CURE BY BIER'S METHOD.

By L. A. BICHOT.

*Veterinary Surgeon attached to the Veterinary Infirmary of the 5th Hussars at Nancy.*

This short note relates simply to the cure of an apparently hopeless case arising from a penetrating nail. The cure was due in a great part to the adoption of Bier's method.

On March 22, in the course of a visit I made to a friend near Nancy, where I was on military service, he showed me a colt that had been affected for six weeks with a penetrating wound under the foot caused by the tooth of an American forked nail. A probe introduced into the wound revealed a fistula between the wall and the third phalanx. Fear of injuring the synovial articulation hindered me from measuring the exact depth of the fistula. Some humid dressings, applied after thinning the horn, not having given any good results, operation was decided on. The caries of the os pedis was easily curetted, and stretching of the fistula enabled one to see a fleshy, greyish necrotic bud. With the aid of forceps it was raised and removed with curved scissors; but soon purulent synovia flowed away, which issued from the second phalangeal articulation. One could also see

quite plainly at the end of the tunnel so made the inferior iridescent extremity of the second phalanx.

Following out communications made by Army veterinary surgeons in particular, and calling to mind the lessons of my master, M. Coquot, on the excellence of Bier's method in such cases, I recommended an india-rubber bandage to be put on the middle of the cannon bone, and I put on also a compressive dressing made up with tincture of iodine and boric acid. I re-applied the dressing every eight days, and the india-rubber bandage was put on for an hour, morning and evening. On April 28 the colt was considered to be cured. During the whole time the animal was at liberty in a loose box with its mother; in spite of the fatigue of the ailing limb, both ankylosis and laminitis were avoided.—*Recueil de Médecine Vétérinaire.*

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## POISONING BY GLECHOMA (GROUND IVY) IN THE HORSE.

By J. FERENCZHAZSY.

*Municipal Veterinary Surgeon at Kevchaza.*

The author has observed nine cases of intoxication due to ground ivy (*Glechoma hederacea*), and yet this labiate has occasioned no trouble in cattle and sheep that consumed it.

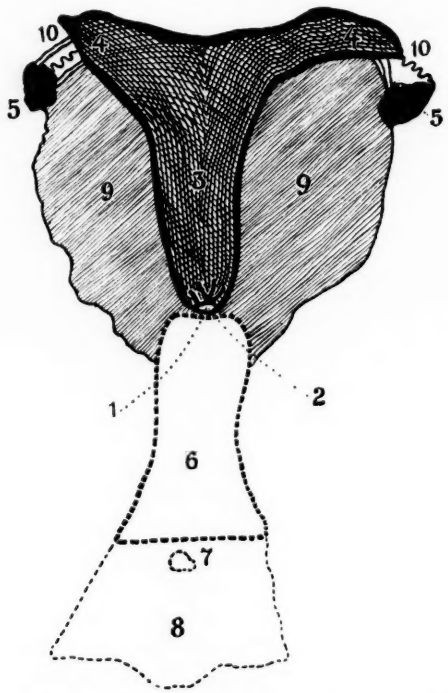
The symptoms observed in horses were as follows: Anxious look, dyspnœa, salivation, sweating, dilatation of the pupils, cyanosis, signs of pulmonary œdema. In the stable there was a strong narcotic odour emanating from dried lucerne mixed with numerous bluish labiate flowers and little dark green leaves of ground ivy; it was to the latter plant that the strong odour in question was attributable, and the ethereal oils therein had caused œdema of the lungs. The ailing subjects were taken out of the stable and bled; camphorated injections were then given to them and castor oil administered, and thereafter tannin in mucilaginous water. Six were cured and two died. At the autopsy there was pulmonary œdema and cerebral hyperæmia, but the digestive tube was intact. Similar cases were observed last year by other owners; through lack of treatment they terminated fatally.—*Recueil de Médecine Vétérinaire.*

XUM

## AN UNUSUAL CAUSE OF STERILITY IN A MARE.

By J. F. D. TUTT, M.R.C.V.S.
*Winchester, Veterinary Remount Officer for the Borough.*

The subject was a valuable thoroughbred mare recently sold to the present owner at a low sum, owing to the fact that she had not conceived in spite of repeated services. On examination *per vaginam,* no os uteri could be seen, although it could




1, occluding vaginal wall; 2, os uteri isolated by occluding anterior vaginal wall (1); 3, body of uterus; 4, uterine horns; 5, ovaries; 6, vagina; 7, meatus urinarius; 8, vulva; 9, broad ligament of uterus; 10, Fallopian tube.

be distinctly felt behind the anterior wall of the vagina. The vagina, as it were, formed a sac-like structure, no communication existing between it and the uterus (see diagram).

The anterior wall of the vagina (1 of diagram) could be pushed into the os by means of the finger tips; it was *not* a case of imperforate hymen, as would occur at first to the mind of the

reader. Treatment advised was operation, incising the occluding vaginal wall (1 of diagram), and so establishing communication between vagina and uterus.

The owner consented, as the mare's value would be considerably enhanced if she could be got in foal. Owing to the outbreak of the present war, and the conditions caused by same, this has not been done; but the writer hopes, at no distant date, to record the result of the operation, if same is then rendered possible.

## Canine and Feline Clinicals.

### BIER'S TREATMENT IN A BULL-DOG.

By G. MAYALL, M.R.C.V.S.

In The Veterinary Journal for May, 1914, Mr. Charles Hartley, jun., F.R.C.V.S., of Lincoln, published a very interesting paper on Bier's treatment in veterinary practice. On July 9, a bull-dog, "Prince," owned by the proprietor of a picture-house here, was brought to me with eczematous sores about his head and hind feet. On examining the hind legs I found bulgy swellings on the outside of the hock joints and just below them, and on squeezing these swellings they burst and discharged a dirty, dark-coloured, bloody fluid. I treated the dog from July 9 to August 4 with antiseptic baths, squeezing the sores under water in the bath and afterwards dressing the places with boracic ointment to which a few drops of pure carbolic acid were added. Internally the dog had pills of calomel and antim. tart. On August 1 he was so much better that he was returned home. On August 4 the owner brought him to me again, saying that his hocks were not quite right, and on examining him again I found that from small holes round about the tarsus there was still some bleeding, which increased when the joints and skin were pressed. The skin round the hocks and beneath them was also much thickened and devoid of hair.

From August 4 to August 13 I gave the dog a daily bath (up to above his hocks) in lysol solution and commenced putting on each hind leg above the hocks an india-rubber umbrella ring. These I left on for about two hours, morning and afternoon,

with a pretty long interval in between. After about three days of this treatment the discharge from the sores became less and the skin looked less inflamed and tumefied. Briefly, the india-rubber ring treatment and the lysol baths were continued for nine days, when the dog was discharged cured and he has been all right since. I have had several cases of these troublesome discharging swellings on dogs' limbs and shall certainly adopt Bier's treatment with any more that come to hand.

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## TETANUS IN A DOG.

By T. M. INGLIS, M.R.C.V.S.
*Forfar.*

A FOX-TERRIER, about 2 years old, was brought to me for examination, the owner, a medical man, recently resident in India, suspecting rabies. The case looked suspicious at first, but careful observation revealed clearly all the typical symptoms of tetanus. Retraction of the eyeball was well marked, the patient could be lifted about like a stuffed dog and remained quite rigid when put down. The jaws were never completely closed and the animal was able to take nourishment with assistance. Having made up my mind I had a case of tetanus to deal with, I gave an aperient and every second day a small dose of antitetanin until six doses had been given. I put the subject in a dark cage and watched developments. About the third or fourth day I observed an improvement in the way of lessened excitement when asked to move. The muscles became less tense and the animal was able to get his head down to his food. Improvement continued and all the bad symptoms gradually disappeared, although it was quite a fortnight before the eyes became normal. The animal had been ill about a week before being brought to me.

I found a small abrasion on one of the fore paws which might have been the seat of infection. I am not altogether satisfied that the antitetanin had a curative action, but I think it had some influence on the recovery of the case. I have had well-marked cases of tetanus in cows and bullocks but this is the first one I have had in the dog.

# CÆSAREAN SECTION IN A CAT.

By H. C. GANGULY.

*House Surgeon, Canine Ward, Bengal Veterinary College, Calcutta.*

Though Cæsarean section may have a wider existence in the medical profession, it is not to be contemplated any the less important an operation in veterinary surgery. A fair number of such are frequently performed on canines, felines, and the larger obstetrical patients in this part of the country with varying success. And it cannot be denied that the aseptic treatment which has such an important bearing upon successful results in abdominal surgery speaks of a lasting memorial to the creative genius of Lister. Owing to the difficulty in obtaining perfect asepsis, more especially in the larger animals, necessary for the success of this operation, our attempts are frequently made futile by finding the fœtus in a septic and mutilated condition, or by the later restlessness of the patient.

On June 26 last, a white Indian cat, in a somewhat fatigued state, belonging to a Bengalee gentleman, was admitted into this hospital for treatment of dystokia. The patient was reported to have been in labour pains for over twenty-four hours. On manual exploration *per vaginam* a highly decomposed right fore leg of the fœtus, with the head twisted inside the womb, was being presented. Owing to the comparatively large size of the fœtus and narrowness of the passage, which hardly permitted of a finger and forceps together to pass through, attempts at delivery by the usual means seemed to be quite impossible.

As the cat was a fairly well-nourished one and had been suffering persistently from intense pain, an operation was suggested as a last resort.

*Modus Operandi.*—The cat was placed on her back on the operation table, an area of about 5 in. by 3 in. on the abdomen was cleanly shaved and painted with tincture of iodine. Thus having prepared the operation field, the cat was put under deep anæsthesia with 3 dr. of freshly made A.C.E. mixture, a longitudinal incision of about $3\frac{1}{2}$ in. in the median line, exposed the subcutis and other underlying structures, the tunica abdominalis and rectus abdominis were quickly slit open, until the abdominal cavity was reached. Then with all possible aseptic precautions the parietal peritoneum was divided, and by setting aside the

mesentery and other viscera with the index finger, the left horn of the gravid uterus was brought into view.

Then by keeping open the cavity with two retractors held by an assistant from either side, the uterus was gently pulled out (with two fingers against the abdominal incisions), turning the patient, at the same time, a little to the left to prevent trickling of uterine fluid into the abdomen. Subsequently, by incising the visceral peritoneum, longitudinal and circular muscle fibres of the womb, and by letting out the putrid fluid therefrom, a decomposed fœtus, with all its coverings, was removed.

The uterine cavity was then thoroughly cleansed and an ounce and a half of normal saline solution was poured in. The

edges of the uterine wound were sutured with catgut, the lips being inverted to allow of adhesion between the two in-contact peritoneal surfaces. The abdominal muscles were next sutured with catgut, and finally the skin by interrupted silk sutures. The wound and its surroundings were thoroughly sponged out with lysol solution, and later wiped and dried with boro-iodoform. Collodion was painted over the stitches and the part protected by antiseptic gauze under plenty of boric padding, and then bandaged with moderate pressure.

The operation was practically a bloodless one and needed no steps for arresting hæmorrhage. On the same evening the cat was given 8 minims each of chloric ether and sweet spirit of nitre to 2 drams water and a little warm milk.

Next morning the temperature was 103° F.: 4 oz. of physiological salt solution made from B. W. and Co.'s compound soloids, were injected subcutaneously on each side of the chest. The uterus was syringed out with a few ounces of (1-40) liquid extract hydrastis lotion. In the evening the temperature was 104·1° F. Anti-streptococcus serum 10 c.c. (Parke, Davis and Co.) was injected hypodermically, close to the seat of the operation, and a thick piece of flannel was wrapped all round her abdomen.

On the 28th temperature was found to be 105° F. The uterus was gently douched out with ½ per cent. solution of lysol and the animal left alone in a cage. In the evening she was given aletris cordial Rio 5 minims and brandy 10 minims with a little water.

On the 29th, on account of the gradual rise of temperature, the operation wound was re-opened and it was found that the last three posterior skin sutures, after having worked loose, were suppurating. They were forthwith removed and after thorough cleansing the slightly dilated lips were not re-stitched but were allowed to unite by granulation. The rest of the incision had already united, yet the stitches were not removed until a few days later.

From the 30th the animal gradually commenced to improve and accepted food. During the first four days after operation the cat was totally off feed, rectal injections of 4 oz. of egg-flip with 10 minims of brandy, twice a day, being all she had as sustenance.

On the eighth day, bandages and other coverings were removed and a little boric powder was occasionally dusted on until July 12, when the animal was discharged, making a complete recovery within sixteen days.

# Abstract.

## ABSTRACT FROM THE REPORT OF MR. T. D. YOUNG, M.R.C.V.S., ON HIS VISIT TO THE ARGENTINE REPUBLIC IN CONNECTION WITH THE INSPECTION OF MEAT IN THAT COUNTRY.

MEAT INSPECTOR'S OFFICE,
503-4, CENTRAL MARKETS,
SMITHFIELD, E.C.,

*To the Worshipful the Sanitary Committee.*

VISIT TO THE ARGENTINE REPUBLIC.

GENTLEMEN,—I herewith submit to you a Report and Appendices dealing with the methods adopted in preparing meat for human consumption, from the time the animals arrive at the Frigorificos until the meat and offal arrive in this country.

On arrival at Buenos Ayres, I was met by Dr. Suarez, representing the Argentine Minister of Agriculture, and the Secretary of the British Legation, representing Sir Reginald Tower. Both of these gentlemen were untiring in their efforts during the time I was in the Argentine Republic, and rendered your officer every assistance.

After being introduced to the Minister of Agriculture and the Officers of the Rural Society (equivalent to the Royal Agricultural Society of Great Britain), also the President and officials of the League Agrarian, all of whom are interested in the exportation of meat and the breeding of cattle, I commenced the work which I had been invited to perform, namely, to view the work of meat inspection as conducted at the Frigorificos in Buenos Ayres, Campana and Zarate.

IMPORTANCE OF THE ARGENTINE DEAD MEAT TRADE.

It is of interest to consider here the importance of the dead meat trade of the Argentine Republic and how necessary it is that the Corporation of the City of London should be satisfied that the meat arriving within its jurisdiction is prepared for human consumption under hygienic conditions, is carefully in-

spected as to freedom from disease, and is conveyed from the place of slaughter to the Central Markets, Smithfield, in a satisfactory manner.

The following figures show, not only the importance of the trade, but how much the Central Markets depend on supplies from South America:—

PERCENTAGES OF MEAT IMPORTED.

| Country | Beef | Mutton and Lamb | Pork |
|---|---|---|---|
| Argentine Republic ... | 82·60 ... | 22·20 ... | — |
| Australasia ... ... | 17·30 ... | 72·43 ... | — |
| Belgium... ... ... | — ... | — ... | 1·75 |
| Holland... ... ... | — ... | 2·30 ... | 92·77 |
| Other countries ... ... | 0·09 ... | 3·07 ... | 3·06 |
| U.S.A. ... ... ... | 0·01 ... | — ... | 2·42 |

The weight of chilled beef from the Argentine Republic in 1913 exceeded the weight of that sent in 1912 by 66,822 tons or 34·4 per cent.

The exportation of cattle and sheep from the Argentine Republic into Great Britain began in 1889, and the trade increased very rapidly.

## METHODS OF SLAUGHTER.

*Handling of Carcases and Offal.*—In order that the system of slaughter, &c., be understood, I think it best to follow the animal from the time it enters into possession of the Frigorifico owners until the meat, offal, &c., is ready for shipment.

*Preparing Animals for Slaughter.*—The animals are purchased in the markets or on estancios and thence conveyed by rail or steamer to the "corrales" or "camps." Some Frigorificos have very large camps extending over 6,000 acres. There the animals rest and feed on grass for some time, depending on the demand of the British markets; from there they are brought to the "corrales," where there is accommodation for 3,000 to 5,000 animals; here they are fed, watered and rested for forty-eight hours, and then watered only for twenty-four hours in what is called the "hungering place."

Prior to slaughter they are removed in numbers and put under a spray bath for some time, where jets of water fall on and around them; this is said to cool and quieten the animals and also to loosen the dirt on the skin.

In one place they are put through a swimming bath: I was assured that this did good, and no doubt those responsible must

be qualified to judge the benefits derived, but other persons viewing the following procedure may have a different opinion. The method is as follows:—

The animals are driven up a few steps and then down a few steps into a bath through which they swim, but there is a considerable amount of struggling and crushing when two animals enter the passage which leads to the bath. The method of driving the animals on is by means of an electric pole which conveys a slight shock to the animals: this has been found a much more humane method than using sticks, &c.

One animal goes in front of the other, then into the bath, swims through the dirty water in which scores of its companions have previously gone, then struggles up a few slippery steps into what is called the "knocking box."

*How Animals are Killed.*—The animals pass into two "knocking boxes," the doors behind them are closed, thus they cannot move in any direction as the boxes are about the size of a large ox. A man standing on a platform nearly level with the back of the animal hits it on the front of the head, or if the head is turned down the blow is aimed at the back of the head. The hammer used is not like the pole-axe employed in this country, but has a flat face, somewhat like a blacksmith's forge hammer, the reason being that a pole-axe would injure the brain, which has a commercial value. The animal falls from the effect of the blow, a lever is pressed, one side of the box rises as also the floor from one side, so that the animal is pitched out; it falls on to a floor where a boy stands ready with a chain, part of which he puts round the animal's hind legs just above the hock joint, the other part he attaches to a hoist which quickly raises the dead animal to a sufficient height to allow the weight of the body to run it by gravitation by means of a hook and rollers to the place where the animals are bled.

*How Animals are Bled.*—In some of the places an electric travelling crane conveys the dead animals at the rate of one per minute to the place where the animals are bled. There a man stands with a large knife and opens the large blood-vessels at the entrance to the chest. After the blood has ceased to run out of the carcase, it is pushed along as described to the place where the "header" stands, who skins the head and disjoints it from the neck, but allows it to remain attached by means of the skin.

The carcase is now quickly removed to the dressing hall, the man in charge of it looks for a place on the floor where the slaughtermen have finished skinning a carcase and there deposits it.

*Dressing and Skinning the Carcases.*—The slaughtermen or dressers at once begin to remove the skin from the carcase, with the exception of the part which is next the floor, that is down the centre of the back. The sternum is sawn through, as also the pelvis, the abdomen is opened, the omentum removed, and the carcase is again pulled up by an electric hoist; as it is being hoisted the head is removed and the internal organs pulled out on to the floor and the skin removed from the back. Two men with a double-handled or cross-cut saw then divide the vertebræ, and the carcase now hangs in two halves called " sides " of beef.

If the carcase is found free from disease by the inspector, it is pushed away to make room for another. If it is found diseased it may be at once sent with all the organs for destruction, or it may be sent to the detention room for further examination. Two men now begin to wash, trim and clean the sides of beef; the method of trimming and finishing is somewhat similar to that in this country, but the method of washing is far superior.

In some of the abattoirs in England an old wooden tub is used to hold the washing water. This water is often not changed during the whole day's work, but has fresh water added to it when required. The cloths or swabs being pieces of old meat wraps, by means of which the sides of beef are washed down, invariably these cloths are never properly scalded or kept as clean as they ought to be, and in some cases are used from day to day until worn out and discarded and then replaced by another of similar material.

In the Frigorificos a good system is adopted of having a tank fixed above the dressing place. In this water is kept at a suitable temperature and conveyed by means of an india-rubber pipe in such a way that it can be attached to the middle of a brush made of fibre through which a hole is bored into the back, and thus a steady stream of clean fresh water continually flows through the brush so that the same water is never used twice, and the brush is scalded at the end of each day's work. I examined these brushes and found them quite free from any objectionable matter, and they bore evidence that the statement just made was carried out, namely, as to scalding daily.

### Disposal of the Carcases and Offal.

The sides of beef are now sent by rail towards the entrance of the refrigerators, where they are allowed to hang until a number have accumulated, sometimes about an hour's duration. They are then classified; those intended to be frozen are put into the chambers at a temperature of 10° F., those intended to be chilled into a temperature of 29° F., where they are kept until ready for shipment, the time depending upon the demand of the British markets.

Prior to being shipped they are stamped, weighed, graded, labelled, and put on board the transporters or ocean steamers.

### Sheep.

Sheep are slaughtered in the same manner as in this country, that is by placing them on a crutch, a knife is passed quickly through the neck, the main blood-vessels are severed, also the spinal cord. The carcases are dressed in a similar manner in all large factories, namely, on a hook and not on the floor as in the London method.

After being skinned the carcases, if sound, are thoroughly cleaned; in some places they are put on a travelling rail, on which they are graded, then weighed, stamped, labelled, and passed into the refrigerators at a temperature of about 10° F.

### Bovine Offal.

Having described how the carcases are handled it is interesting to observe how the offal or by-products are disposed of. It is here that the great difference exists between the old methods existing in this country and the modern methods of the Frigorifico owners in operation in South America. As briefly as possible, consistent with giving the necessary details, I here describe what is done with all the offal.

*Blood.*—As all the animals are bled at one place, the blood enters into a tank from which it is forced through pipes to the compartment where it is steamed, pressed, and ultimately dried for use as blood manure.

In some Frigorificos great care is taken to obtain the blood as pure as possible, and the finished product showed 17½ per cent. of ammonia.

*Hides.*—The hides are fleshed (in some places by machinery, in other places by hand), that is to say, any pieces of the sub-

cutaneous tissue left on the hide is cut off, the hide is then washed, scrubbed and sprayed, next put into a wet pickle for some hours and ultimately taken out, classified, put into packs, with dry salt between each hide and kept for about three weeks. They are sold to the highest bidder irrespective of what country he comes from.

*Hair from Tails.*—The hair taken from the end of the ox tails is washed, dried and exported, being used for furniture stuffing, &c.

*Feet.*—Feet are disposed of in a variety of ways: the leg bones from them are washed, boiled, dried and sent away to make knife handles, &c., the tendons are dried and sent away to make glue. The hoofs are dealt with in a similar manner. From the internal portion of the foot Neat's foot oil is extracted.

*Horns.*—The horns are dried, boiled down, ground and used for fertilizer. The piths from the horns are dried and sent away to make glue.

*Heads.*—The flesh from the sides of the head (termed head meat) is washed, cleaned, frozen and exported. The skull is split down by means of patent machinery or by hand labour, the brain being left undamaged. The bones are ground down, digested, and used for fertilizer.

*Brains.*—These are taken carefully from the head, washed, cleaned, frozen and exported or sold locally.

*Tongues.*—The tongues are washed, trimmed, put into moulds to give them the proper shape, frozen, then put into boxes or bags and exported.

*Sweetbreads.*—The thymus or sweetbread is washed, trimmed, frozen and exported, and in some cases sold locally.

*Lungs.*—All the lungs are put into the digester, the majority being affected with parasitic disease.

*Hearts.*—The hearts are washed, frozen, put into boxes and exported; in some cases they are cut up and used for meat extract.

*Livers.*—Only a small percentage of the livers are found free from disease (parasitic); those passed as fit for human food are washed, frozen and exported. Those found diseased are put into the digester for fertilizer.

*Pillars of the Diaphragm.*—The pillars of the diaphragm (termed by the trade " thick skirts ") are trimmed, frozen, packed and exported.

*Œsophagus.*—The muscular portion of the œsophagus is frozen and exported. The connective tissue portion is cleaned, dried, blown up, tied at each end and sold as "weasands," and used for sausage casings.

*Thyroid Glands.*—In some places the thyroid glands are dried, desiccated and exported.

*Suprarenal Bodies.*—In some places these are preserved and exported.

*Gall.*—In some of the Frigorificos, after the gall is collected, a little antiseptic is added, it is then placed into barrels and exported.

*Bones.*—The skulls and bones cut from the carcases, &c., are put through a bone-crushing machine, then into the digester, and used for fertilizer.

*Stomachs.*—Portions of the stomachs are washed, scalded, scraped, frozen and exported.

*Spleens.*—The spleens are all put into tankage (digester).

*Omentum and Mesentery.*—The fat of the omentum and mesentery, if free from disease, is converted into oleo; if diseased it is put into the digester.

*Intestines.*—The intestines are carefully washed, inverted, scraped and carefully examined, any diseased parts cut out, then salted, packed and exported. The diseased parts are sent away to the digesters. From a certain portion of the intestines gold beaters' skin is taken and preserved.

*Kidneys.*—If the kidneys are not left in the carcase they are cleaned, frozen, packed and exported.

*Tails.*—The tails are cleaned, frozen and exported.

*Trimmings from Carcases.*—The trimmings are all carefully collected and sent to the digesters.

*Bladders.*—The bladders are cleaned, blown, dried and exported.

*Generative Organs.*—Those are all carefully collected and sent to the digesters.

*Floor Sweepings.*—All the floor sweepings and small pieces of fat are carefully collected and sent to the digesters.

### Sheep Offal.

*Blood.*—The blood is disposed of in the same manner as from the oxen.

*Heads.*—In some cases the heads were put into the digesters

without the flesh from the cheeks being previously removed. In other cases the flesh was sent to the canning department.

*Tongues.*—The tongues were cut out, salted, boiled and canned.

*Lungs.*—The lungs, as in the case of the oxen, were generally found affected with parasitic disease, and all sent to the digester.

*Hearts.*—These are washed, frozen, packed and exported, and in some cases they are converted into extract.

*Thyroid Glands.*—These are treated in a similar manner to those of oxen.

*Supra-renal Bodies.*—These are also treated in the same manner as in oxen.

*Livers.*—In the majority of cases the livers are found affected with parasitic disease and sent to the digester.

*Stomachs.*—The stomachs are all sent to the digester.

*Intestines.*—The intestines are treated in the same manner as in the case of bovines.

*Bladders and Generative Organs.*—These organs are also sent to the digester.

*Kidneys.*—The kidneys are cooled, packed, frozen and exported.

*Fat.*—The fat from the carcases which are found fit for human food is sent to the oleo department, but from those found affected with disease it is all put into the digester.

*Feet.*—The feet are all put into the digester for fertilizer.

*Sheep Skins.*—The sheep skins are sent to the fellmongering department. It would take too long to describe minutely the whole of the process, but the following is a brief description:—

The skins are soaked and washed, all clots taken off, then dried, painted with a solution, and the wool pulled off.

The wool is put through a drying machine, then packed into bales by means of an hydraulic press and exported.

The pelts are washed and put through a series of processes, packed into barrels and sent to the United States.

As showing the care that is taken of all by-products, and that everything is used that can be converted into money, in some places even the contents of the stomachs are pressed and used as fuel in the furnaces, and the water collected from the floors, &c., passes through catch pins, from which the fat is skimmed off and returned to the digesters.

FRIGORIFICOS IN URUGUAY.

As these two Frigorificos are managed by Messrs. Sansinena Co. and Messrs. The Swift Beef Co., the plans of the premises and the whole method of doing business is very much on the same lines as in the Argentine factories.

All the inspectors, although they are officers of the Government, are practically paid by the owners of the Frigorificos, because the latter are charged by the Government a certain sum for each officer supplied. In the Argentine Republic the owners of the Frigorificos pay to have the meat inspected, but have returned to them all unsound food, it being put into the digesters under supervision, while in this country the local authorities supply meat inspectors free of charge, but in general (some places excepted) retain all unsound food seized. A further very great difference exists between the two countries in that the Government in Argentina accept full responsibility for the inspection of the meat, while in this country the owner of the meat is supposed to have sufficient knowledge of disease to prevent him exposing any unsound meat for sale for human consumption, and the inspection is carried out on the detective principle, that is to say, the inspectors look for unsound food, and in many cases prosecute the owner of the meat if he has exposed for sale, prepared for sale, or deposited in any place for the purpose of sale, meat which is unfit for the food of man.

The Frigorifico owners must provide suitable detention rooms in which all doubtful carcases may be placed until a final decision is given on them. In addition, office accommodation and laboratories must be provided for the use of the veterinary inspectors and their assistants.

During 1912-13 the undermentioned beef was found affected with tuberculosis in the Central Markets: 60 hindquarters of beef, 18 forequarters of beef, 14 top pieces of beef, 4 flanks of beef, 1 aitch bone of beef, 5 rumps of beef, 1 loin of beef.

As a result of complaints made from the Corporation of London as to the above diseased meat having been found in the Smithfield Markets, the Minister of Agriculture considerably increased the number of inspectors at the Frigorificos.

The following figures show the increases, and I was informed that a proposal to appoint other additional officers was under consideration, due to an increase in the number of animals being slaughtered at the Frigorificos and the desire of the Minister of

Agriculture and his responsible officers that the work should be done in a manner thoroughly satisfactory to the authorities of the countries to which meat is exported:—

TABLE SHOWING INCREASE OF INSPECTORS.

| Frigorifico | 1911 Veterinary Surgeons | 1913 Veterinary Surgeons | 1911 Assistants | 1913 Assistants |
|---|---|---|---|---|
| La Blanca ... ... | 4 | 8 | 4 | 9 |
| La Plata ... ... ... | 5 | 9 | 2 | 10 |
| La Negra ... ... | 5 | 10 | 5 | 13 |
| Campana ... ... ... | 2 | 3 | 4 | 6 |
| Las Palmas ... ... | 2 | 3 | 3 | 6 |
| Frigorifico Argentine ... | 2 | — | 2 | — |
| Zareta .. ... ... | 2 | 4 | 4 | 4 |
| | 22 | 37 | 24 | 48 |

Those figures show increases of 68 per cent. veterinary surgeons and 100 per cent. assistant inspectors.

From practical experience I estimate that an inspector can satisfactorily examine 100 beef carcases or 500 sheep carcases per day of eight to ten hours. If he has to do more than those numbers he becomes tired at his work, which is monotonous, and will probably miss some lesions of disease.

Taking the above figures as a basis, the following analysis shows a very great difference in the allocation of officers in the Frigorificos:—

| Frigorifico | Animals killed per day | | | | Estimated number of men necessary | Number of men actually present on duty |
|---|---|---|---|---|---|---|
| La Blanca ... | 1,000 cattle at 100 per day per man | | | | 10 | 17 |
| La Plata ... | 1,550 | ,, 100 | ,, ,, | 15 | 26 | 19 |
| ,, ... | 5,500 sheep | ,, 500 | ,, ,, | 11 | | |
| La Negra ... | 1,050 cattle | ,, 100 | ,, ,, | 10 | 15 | 23 |
| ,, ... | 2,550 sheep | ,, 500 | ,, ,, | 5 | | |
| Campana ... | 900 cattle | ,, 100 | ,, ,, | 9 | 14 | 9 |
| ,, ... | 2,500 sheep | ,, 500 | ,, ,, | 5 | | |
| Las Palmas ... | 600 cattle | ,, 100 | ,, ,, | 6 | 12 | 9 |
| ,, ... | 3,000 sheep | ,, 500 | ,, ,, | 6 | | |
| Zarate ... | 600 cattle | ,, 100 | ,, ,, | 6 | 6 | 8 |
| | | | Totals ... ... | | 83 | 85 |

NOTE.—Frigorifico Argentino not included.

It will be seen that when taken together the totals come very near one another, but the distribution seems bad, for example:—

Let "plus" equal too many and "minus" equal too few, then:—

| | | |
|---|---|---|
| La Blanca ... | = ... | plus 7 |
| La Plata ... | = ... | minus 7 |
| La Negra ... | = ... | plus 8 |
| Campana ... | = ... | minus 5 |
| Las Palmas ... | = ... | ,, 3 |
| Zareta ... ... | = ... | plus 2 |

It may be argued that any inspector can examine more than 100 beef carcases and 500 sheep carcases and offal per day; that, of course, depends entirely upon the percentage of disease found among the animals. Personal experience of Argentine stock at the Deptford Cattle Market and observations as to the percentage of disease found in the Argentine offal convince me that the number previously allotted to each inspector is the maximum that should be given in order to secure efficient inspection.

*Qualifications of Veterinary Surgeons.*—All the veterinary surgeons are graduates of either Las Palmas or Buenos Ayres Veterinary Colleges, both of which are affiliated to the Buenos Ayres University.

*Qualifications of Assistant Inspectors.*—The assistant inspectors are men selected from practical butchers when they can be obtained; if not, then from men who have had experience in the handling of meat.

They are trained by the veterinary surgeons, but do not pass any examination, and further do not hold certificates as proof of their knowledge of the duty entrusted to them, although I was informed that they did not pass or condemn any doubtful meat, but simply called the attention of the veterinary surgeons to abnormal appearances in carcases and organs.

### Description of the System of Meat Inspection in the Frigorificos.

The meat inspection and hygiene in each Frigorifico is under the entire control of a chief veterinary surgeon, who has under him a staff of veterinary surgeons and lay assistant inspectors.

*Ante-mortem Inspection.*—The owners of the Frigorificos must give at least twenty-four hours' notice prior to the arrival of the animals at the corrales as to the number expected and the district from which they are arriving. If from a public market, a veterinary certificate stating that the animals are free from contagious disease must accompany them and be handed to the chief veterinary officer at the Frigorifico.

On arrival of the animals they are inspected, and any apparently doubtful are at once removed, either for careful observation or immediate slaughter. If the latter, a *post-mortem* examination is made in a special slaughter-house.

If the disease is of a contagious nature, *e.g.*, anthrax, the

carcase and all organs are at once destroyed, and everything which has been in contact is disinfected; the remaining animals are kept under careful observation until they are slaughtered.

*Method of Examination.*—Immediately the carcase of a bovine animal is hoisted from the ground a veterinary inspector with an assistant takes on the examination of the organs as follows:—

*Head and Tongue.*—The palates are examined, then the lymphatic glands (retropharyngeal and submaxillary) incised.

*Lungs.*—These are palpated, the glands (bronchial and mediastinal) incised.

*Heart.*—The heart is extracted from the pericardium and examined.

*Liver.*—The liver is palpated and the hepatic glands incised. If any abnormal appearances are observed in the organ an incision is made to ascertain its nature.

*Stomach.*—The stomach is examined for evidence of disease and the lymphatic glands incised.

*Spleen.*—The size and appearance of the spleen is carefully noted.

*Mesentery and Intestines.*—The appearance of the intestines is noted and the chain of mesenteric lymphatic glands is incised.

*Generative Organs.*—Appearance is noted, and, if necessary, incisions are made.

*Carcase.*—While the organs are being examined the carcase is sawn into two halves. The inspectors now direct their attention to these portions, the bones of the vertebræ, &c., are noted, then the serous membranes. If all the organs and carcase appear normal, the organs (tongue excepted) are passed. The tongue is washed, hung up and again examined by another inspector, who notes if the lymphatic glands have been incised and that no lesions are apparent, as it is possible to fail to observe a small lesion if it be covered with blood at the first examination.

The carcase is pushed along the rail on which it hangs, and after being carefully washed and trimmed, it is again examined by another inspector in order to look for lesions which may have escaped the observation of his colleagues. If no lesions are found at the second examination the carcase, now in two sides, is passed, stamped and pushed along towards the entrance to the refrigerators.

*Sheep.*—Immediately the carcases of sheep and lambs have

been "dressed," that is, skinned and washed, the veterinary inspector and assistant examine the "pluck," which consists of the lungs, heart, liver and spleen; then the carcase by observing the serous membranes and palpating the parts containing the precrural, inguinal and prescapular lymphatic glands.

If the organs and carcase are free from disease they are passed, and the carcase is then put on the "grading rail," stamped, and subsequently placed in the refrigerators.

Carcases free from disease, but too poor in quality for freezing, are sent to the canning department.

*Pigs.*—Very few pigs are killed in the Frigorificos, and those only for local consumption. After the "pluck," that is, the lungs, heart and liver, has been detached from the carcase, the veterinary inspector and assistant examine the lungs by palpating them and cutting into the lymphatic glands. In a similar manner the liver is examined and the appearance of the heart is noted.

The carcase is then examined, the appearance of the serous membrane noted, the lymphatic glands of the head incised and portions of the carcase excised for special examination for trichina; if the carcase and organs are normal they are passed, stamped and loaded into vans for removal to the city shops.

The foregoing description applies to normal carcases. Argentine animals are very free from diseases (aftosa and parasitic diseases excepted).

From personal experience of them at Deptford Market, examination of imported offal, and observations at the Frigorificos, the undermentioned diseases are most common amongst the animals:—

*Cattle.* — Actino - bacillosis, actinomycosis, distomatosis, echinococcus veterinorum.

*Sheep.*—Caseous lymph-adenitis, distomatosis, echinococcus veterinorum.

*Pigs.*—Cysticercus cellulosæ, tuberculosis, trichina.

Carcases and all the organs absolutely normal are not very common; the beef carcases are, with the exception of a very small percentage, very free from disease, but the reverse applies to the organs, especially the lungs and livers, these being extensively affected with parasitic disease.

Carcases exported from Argentina to Holland must have the lungs, liver and spleen left *in situ*, and I was informed that only

a small percentage of carcases were found suitable for these requirements, the carcases being generally free from disease, but one or more of the organs showed lesions generally parasitic.

As in all systems of meat inspection, if disease is "localized" in certain organs, these are destroyed and the carcase passed, but where the disease is one that might be called systemic, then care has to be exercised in dealing with the carcase and organs.

### General Remarks.

In describing the buildings and fittings, also the health and cleanliness of the employees, transporters, loading of meat, steamers, &c., criticisms have been made, the chief of which are as follows:—

(*a*) The use of too much wood in some places instead of impervious material.

(*b*) The necessity of enforcing the wearing of overalls by those handling meat for human consumption.

(*c*) The bad arrangement of the buildings in some of the Frigorificos, that is to say, the offensive trades being conducted in too close proximity to where food is prepared.

(*d*) Necessity of paving the approaches and surroundings of the Frigorificos.

### A Suggestion.

During my investigations in Argentina I formed the opinion that a good veterinary officer attached to the British Legation in Buenos Ayres could perform much useful work.

Similar officers are stationed in London acting on behalf of the Argentine, Australian, New Zealand and United States of America Governments.

So strongly was I impressed with the idea that I asked the opinion of a number of importers of pedigree stock, the Managers of Frigorificos, &c., all of whom stated that such an appointment is highly desirable, and importers of live stock at once expressed the desire, if such an appointment were made, to pay a proportion of such an official's salary. These importers stated that for a very long time they have felt the want of a good reliable expert to watch the interests of Great Britain in connection with imported animals.

The officials of the Direccion General de Ganaderia in Buenos Ayres would welcome such an officer and in return for the

kindness shown to their veterinary surgeon in London would extend every facility to the representative from Great Britain.

### Suggested Functions of such an Official.

The officer could make careful observations, by visits, as to the system of meat inspection existing and the class of meat used, also the hygiene in the canning of foods, extract of meat, powdered meat, &c., in the Frigorificos, factories, &c.

The presence of such an officer making periodical visits would greatly tend to keep the inspection and class of goods used, also the hygiene, at a high standard, and this is very necessary as no inspection of tinned foods, &c., can be perfectly carried out after its arrival in Great Britain.

That an important duty exists in this matter can be shown by the following figures, which show the exportation from Argentina in 1910:—

| | Value in gold dollars. |
|---|---|
| Extract of meat... ... ... ... ... ... | 3,916,680 |
| Tinned and salted tongues ... ... .. ... | 284,352 |
| Powdered meat ... ... .. ... ... ... | 1,267,964 |
| Preserved meats .. ... ... ... ... | 1,208,187 |
| Concentrated soups ... ... ... ... ... | 204,293 |

The above figures are in addition to carcases of mutton and quarters of beef (frozen and chilled) sent into this country.

The officer could attend *post-mortem* examinations at the Quarantine Station of pedigree animals, killed after having been tested with tuberculin. This would be very important work; the results of the various testing systems could be definitely ascertained as no place could give so conclusive results as one where animals are slaughtered after showing reactions to tests.

The system of controlling contagious diseases could also be carefully watched. At present a new bacteriological institute is being erected in Buenos Ayres, and judging from appearance will not only be one of the finest in the world, but the methods adopted in connection with the control of diseases and scientific research will be on the most modern principles.

Attempts will be made to control, and if possible to stamp out, "aftosa" (foot-and-mouth disease); such work carefully watched and reported on would prove of great value to the British Board of Agriculture.

A new Order has just been issued making it compulsory that

all pigs imported into the Argentine Republic are to be tested with tuberculin. The results will prove interesting, and in many ways the officer's annual report would be of great educative value.

The officer could also direct his attention to the exportation of horses to Great Britain. It is believed that there is a great future in Argentina in the breeding of Army horses for other countries.

He could also perform the same duties as the United States of America require their officer to perform—namely, attend to the disinfection of all hides, &c., exported to Great Britain. Large cargoes of maize are exported from Argentina, and it is possible that this grain, which is intended for animal food, may be put into vessels which have previously conveyed hides, hoofs, &c., and not been properly disinfected.

He could also keep the British Board in full information as to the prospects in Brazil, Argentina, Venezuela, Uruguay, and Paraguay of new districts being opened up for the supply of beef cattle. This is a very important question owing to the prospects of a scarcity of beef throughout the world.

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H.I.M. THE EMPRESS OF RUSSIA has favoured the proprietors of Dr. J. Collis Browne's Chlorodyne with a large order for that famous medicine to be sent to Russia. As is well known, Dr. Browne's Chlorodyne is a sure preventive and curative of dysentery and other intestinal complaints.

## Translation.

### PARASITIC CATARACT OF ROACH.

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In 1912 our attention was called to some exorbited roach, and we endeavoured to trace the cause of the lesions. We noticed that a large number of the subjects of the same species and from the same region had a variable opacity of the pupil involving the crystalline lens, or, in other words, cataract.

Finally, microscopic examination revealed the presence of young trematodes in the interior of the lens analogous to those observed in perch in Germany, but which to our knowledge have not yet been seen, at least with such frequency, in roach.

The roach infested came from Dutch waters, at the mouth of the Meuse and Rhine; their appearance was not first-class; they were small in size, thin, soft, scales easily removed, &c., the majority of these characters showing damage to the general condition of the fish. In the lots examined it was always possible to find a certain number of subjects that had lost one or even both eyes, the orbit was absolutely empty, gaping, with a little whitish spot in its depth, the termination of the optic nerve. The exorbitation appeared recent. In another fish the eye showed no other lesion, but a turbid appearance, more or less accentuated, of the corresponding pupil, or, as we have written, an opacity of the crystalline lens. This latter had preserved its transparency in numerous individuals, but in advanced cases the opacity was absolute, the lens was as white as that of cooked fish, not allowing any light to filter through, and the fish was blind. In general the two eyes were affected to the same degree.

Under the microscope the crystalline lens, crushed between two slides, showed some very curious parasites alive and mobile, which we recognized as *Diplostomum volvens* (Mordmann), larvæ of *Hemistomum spathaceum*, a frequent trematode of aquatic birds, in the intestine of which it attains its adult form.

*Diplostomum volvens* is a little foliaceous trematode, somewhat similar to a distoma, but without a very fixed form, for it moves itself by reptation, drawing itself up and retracting itself, forming itself into a ball or curving itself in every direction; in short, without exaggeration one can compare its movements to those of an enormous amœba. Its shape is like an elongated bottle. It has an anterior extremity provided with three auricles, and a short prolonged posterior extremity like a sac. There are two vents—an oral one, very small, and a ventral one, very marked.

These larvæ involve the whole of the crystalline lens when the malady is advanced; but at first, when the lens is still transparent, the diplostomes are only encountered at the level of the anterior face, immediately behind the crystalloid.—*Hygiène de la Viande et du Lait.*

# Reviews.

**Castration (including Cryptorchids and Caponing) and Ovariotomy.** By Frederick T. G. Hobday, F.R.C.V.S.,F.R.S.E. 80 illustrations in the text. Published by W. and A. K. Johnston, Ltd., Edinburgh and London, 1914.

This little volume of 160 pages may be described as the standard textbook of castration and ovariotomy in the English language. Those about to conduct these operations for the first time cannot read any better instructions than are given in the pages of this book, and those who fancy they know all there is to know on the subject may pick up some helpful wrinkles from a past and present master of the science and art. This second edition is a considerable advance on its predecessor, and includes fresh and valuable matter in the shape of a chapter from the pen of Sir John Bland-Sutton, F.R.C.S., on "Abnormalities of the Sexual Glands of Man and Horses"; illustrations of the castration of cryptorchid sheep, by Mr. Inglis, M.R.C.V.S., of Forfar; and an illustrated article by Mr. Stanley Elley, M.R.C.V.S., on the "Caponing of Ostriches."

The book comprises ten chapters, dealing respectively with: Castration, scrotal hernia, the castration of cryptorchid horses, cryptorchidism in other animals, caponing of fowls and ostriches, observations upon the effects of castration in animals, ovariotomy and hysterectomy of troublesome mares, ovariotomy of cattle, ovariotomy and ovaro-hysterectomy of the smaller animals, abnormalities of the sexual glands of man and horses.

In reference to castration standing by the clam method the author says: "The clam may be a clean, wooden one, used clean, &c." Throughout his work Mr. Hobday always advises surgical cleanliness, and we are certain that the great percentage of his fine successes are due to observance of this tenet. Regarding castration standing, we prefer to have the attendant turning the colt's head round slightly to the near side, and following our animal round (as he moves) on the near side as he travels or moves round a loose box or enclosed space. When operating with the écraseur and with the subject on his feet it is often an advantage to have him blindfolded. Methods of casting colts for castration are described and special mention is made of Mr. W. C. Hazelton's and Mr. T. H. Parker's modes of procedure. The chapters on cryptorchidism and ovariotomy are strong features of the book, well written, lucid, and the fruit of ripe and extensive experience. Throughout, the work is abundantly illustrated, many of the pictures being unique of their kind. The volume is well printed, tastefully bound, and should find a place on the bookshelf of every practising veterinary surgeon. We feel sure that if pressure of work had not hindered the author from giving his time to writing, this second edition would really have been a third or

fourth one. A much less lucid treatise on the same subject has gone into its sixth or seventh edition in America.

Mr. Hobday dedicates his book to Professor Cadiot, of the Alfort Veterinary School, as a token of esteem and friendship.

G. M.

**The Journal of the Board of Agriculture, September, 1914.**

This is a number of the well-known journal which will be chiefly of interest to veterinarians by reason of its containing articles on "The Cultivation and Collection of Medicinal Plants in England," by W. A. Whatmough, B.Sc., and "The Value of Acorns, Horse Chestnuts and Beech Mast as Food for Stock." The former subject is well illustrated, fields of belladonna, English dill, aconite, foxglove, golden seal, henbane, datura, and valerian being shown.

With regard to acorns it is written that "it seems to be established that dried and shelled acorns may be fed in the ration to all animals without hesitation and with good results." This is the way they are often fed on the Continent, and we quite agree with the statement. The French have a way of telling those acorns that are injurious, for they separate and throw away all specimens of the fruit that float when thrown into a tub of water. They also discard any unsound specimens. When dry the acorns may be ground into meal or crushed, and are then said to be willingly eaten by sheep and oxen. For pig food one observer suggests that acorns are roughly worth per ton about half the price of maize. Store pigs will not get fat on them, but they will grow strong frames on which meat can be laid cheaply subsequently. Pigs do quite well on them when turned out and getting other natural green food as well. Dried, husked, and ground chestnuts have been eaten satisfactorily by cattle and sheep, and beech mast has been fed to poultry and turkeys with good results as a fattening food. For the rest this number of the *Journal* is especially strong on small but important things, such as notes on poultry feeding, poultry on allotments and garden plots, poultry as farm stock, storage and disposal of apples and pears, fruit preserving, &c.

Altogether we consider that this September issue is certainly one of the most useful and interesting ever published by the Board of Agriculture and Fisheries. G. M.

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